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| 09/675,029      | 09/28/2000  | Ricardo I. Fuentes   | 11828/1             | 7682             |

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| EXAMINER |
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CULBERT, ROBERTS P

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| ART UNIT | PAPER NUMBER |
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1763

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/675,029

Applicant(s)

FUENTES, RICARDO I.

Examiner

Roberts Culbert

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION*****Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/8/05 has been entered.

***Response to Remarks***

Applicant's arguments filed 3/8/05 have been considered. Applicant has argued that Britten fails to teach moving the object and tank sequentially in two or more directions relative to each other.

While the examiner agrees that Britten does not teach moving the object and tank sequentially in two or more directions relative to each other *while the meniscus is in contact with the object*, the claims do not require meniscus contact during the sequential movements. As recited below, it would have been obvious to one of ordinary skill in the art at the time of invention to move the object and tank sequentially in two or more directions relative to each other as a matter of bringing the substrate into position for processing and subsequently performing the processing step as recited in Britten.

Applicant's arguments regarding The Britten reference are further moot in view of the new grounds of rejection based on the newly discovered reference to Unger et al. as recited below.

***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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**Claims 1, 2, 4, 7, 10, 12, 17, 25 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,985,166 to Unger et al.**

Referring to the Figures Unger et al. teaches a fluid meniscus process comprising the steps of holding at least a portion of a first surface of an object (fiber) with a holding fixture (350) such that at least a portion of a second surface of the object is exposed, injecting (providing) at least one fluid in a tank (310) such that a fluid meniscus is formed, contacting at least a portion of the second surface of the object with at least a portion of the fluid meniscus, moving the object and the tank sequentially in two or more directions relative to each other (immersion and removal) and removing the object after at least one contact with the fluid meniscus.

Regarding Claim 2, the object is a substrate (substance acted upon)

Regarding Claim 4, the fluid is an etching fluid (320)

Regarding Claim 7, the holding tank has at least one channel to hold the fluid. (Figure 3)

Regarding Claim 10, the fluid etches at least a portion of the second surface of the object. (Figure 3)

Regarding Claim 12 the fluid meniscus is used to perform etching. (Note that in Figure 3, the meniscus of the etching fluid is in contact with the object and therefore etches the object (fiber) at the point of contact)

Regarding Claim 17, the object is moved by linear translation (immersion and removal) See (Col. 5, Lines 1-2 and Col. 6, Lines 46-47)

Regarding Claim 25, the first surface is adjacent the second surface. (Figure 3)

Regarding Claim 26, the holding fixture (350) moves the object into contact with the fluid meniscus. (Col. 4, Lines 37-39)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-19 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,660,642 to Britten in view of U.S. Patent 5,171,393 to Moffat.**

Britten teaches a method for wet etching a substrate by contacting the substrate with the meniscus of a liquid etchant. Referring to Figure 1, Britten shows a processing applicator (10) containing a processing fluid (12). The processing fluid may be a liquid etchant. See Abstract and (Col. 2, Lines 41-50) and (Col. 4, Lines 32-34). The etchant meniscus is contacted with the substrate (26) (Col. 3, Lines 18-25). The fluid meniscus is formed above the edges of the holding tank (15). See Figure 1. The holding tank has at least one channel to hold the fluid, and at least one overflow channel. See Figure 1. The liquid etchant is injected into the holding tank (15) via pump (28). The substrate is removed after contact with the fluid meniscus for rinsing and drying. The substrate may have a protective material layer such as a photoresist (Col. 4, Line 33). Britten teaches moving the substrate relative to the holding tank (Col. 2, Lines 21-25) as well as moving the tank relative to the substrate (Col. 3, Lines 23-26). Britten teaches drying by evaporation, but also shows a gas current such as forced air (dry compressed air) may be applied to the substrate (Col. 4, Line 25). The substrate surface and the fluid meniscus are inherently capable of motion relative to each other in two or more directions and operatively contacting each other when moved in two or more directions since the substrate is not fixed to the assembly (8) as shown in Figure 1. Moreover, Britten clearly illustrates in Figure 2 that the meniscus and object are not only capable of, but do in fact move relative to each other in two or more directions while operatively contacting each other.

Britten does not explicitly teach moving the object and the tank sequentially in two or more directions relative to each other. However it is clear from the teachings of Britten that the substrate must be brought from an initial storage location to a location for processing that is parallel to the top of the tank and meniscus. It is further clear from Britten that the location of the substrate prior to processing could be any suitable location that provides access to the substrate by a holding means.

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It would have been obvious to one of ordinary skill in the art at the time of invention to bring the substrate (object) from a storage location (located either above below or to the side of the processing location) to a processing location (as illustrated in Figure 1 of Britten) prior to processing (etching) the substrate. This task would comprise moving the substrate either up down or to the side of the tank prior to moving the substrate relative to the tank as shown in Britten. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to move the object and the tank sequentially in two or more directions relative to each other. It is noted that the claim does not require that the meniscus and object be in contact during the relative motion in two or more directions.

Further, Britten does not teach the use of a holding fixture for the substrate. However the use of a holding fixture for wet processing is well known in the etching art. Moffat teaches that a vacuum chuck is suitable for holding a substrate for subsequent wet processing steps (Col. 3, Lines 19-21). It would have been obvious to one of ordinary skill in the art at the time of invention to use a vacuum chuck to hold the substrate in order to facilitate wet processing as taught by Moffat. The vacuum chuck holder is interpreted by the examiner to be a "fluidic means" as broadly defined by applicant in claim 3.

Regarding claim 5, Britten shows that the solvent is re-circulated and replenished by use of a filter and pump. See Figure 1. Britten also teaches that it is known in the art to recycle and heat a solvent (Col. 1, lines 52-55). Heating is interpreted to be a form of agitation since claim 5 is not limited to the type of agitation (i.e. mechanical, thermal). It would have been obvious to one of ordinary skill in the art to heat the solution in order to improve the etch rate.

**Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,660,642 to Britten in view of U.S. Patent 5,171,393 to Moffat as applied above to claims 1-19 and 23-27 and in further view of U.S Patent 5,279,703 to Habberger.**

As applied above, Britten in view of Moffat discloses the method of invention substantially as claimed, but does not teach the use of electromagnetic radiation. Habberger teaches a process for etching a substrate in which electromagnetic radiation is used to heat a substrate and improve the etch rate (Col. 4, Lines 65-68). It would have been obvious to one of ordinary skill in the art at the time of invention to

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irradiate the substrate in the well-known manner in order to heat the substrate and improve the etch rate as indicated by Habberger (Col. 4, Lines 6-10). The location of the energy source is not given any patentable weight because one of ordinary skill in the art would recognize that the energy source could be secured anywhere that permits the energy source to focus on the substrate.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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